

**Remarks****I. ARGUMENTS****A. The Law Applicable under 35 U.S.C. §102**

MPEP §2131 states the basic applicable law governing anticipation of claimed subject matter:

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

**B. Rejection of Claims 1-11 under 35 U.S.C. §102(b)**

As recited in independent claim 1, Appellants' invention relates to an apparatus for casting a patterned surface on both sides of a web:

1. An apparatus for casting a patterned surface on both sides of a web, the apparatus comprising:
  - a first patterned roll;
  - a second patterned roll;means for rotating the first and second patterned rolls such that their patterns are transferred to opposite sides of the web while it is in continuous motion, and said patterns are maintained in continuous registration on said opposite sides of the web to within 50 microns.

Claim 1 and its dependent claims (2-11) presently stand rejected under 35 U.S.C. §102(b), as being anticipated by WO 98/52733 (*Prix*). As described more fully herein, this rejection is improper, because *Prix* fails to present a disclosure that enables registration on opposite sides of the web to within 50 microns, as required by independent claim 1.

*Prix* relates to a film that may be placed over a printed article to prevent it from being photocopied. *Prix* discloses an apparatus for producing the anti-photocopy film, and also discloses the film, itself. As seen in Figure 8 of *Prix* (reproduced herein, below), the anti-photocopy film includes a base film (identified by reference numeral 77) having an upper surface and a lower surface. A plurality of lenses (identified by reference character L) is formed on the upper surface of the base film, and a plurality of bars (identified by reference character B) is formed on the lower surface. Ideally, each bar is to be centered about the centerline (identified by reference character M) of a corresponding lens. However, since it is impossible to perfectly

center the bars about the centerline of their corresponding lens, a tolerance,  $\Delta l$ , is specified. This tolerance,  $\Delta l$ , is the cross-web registration disclosed by *Prix*. Applicants' calculations based upon information found at col. 8, line 56 through col. 9, line 15 of *Prix* reveals that *Prix* contains a written description of an article having cross-web registration to within 50 microns.

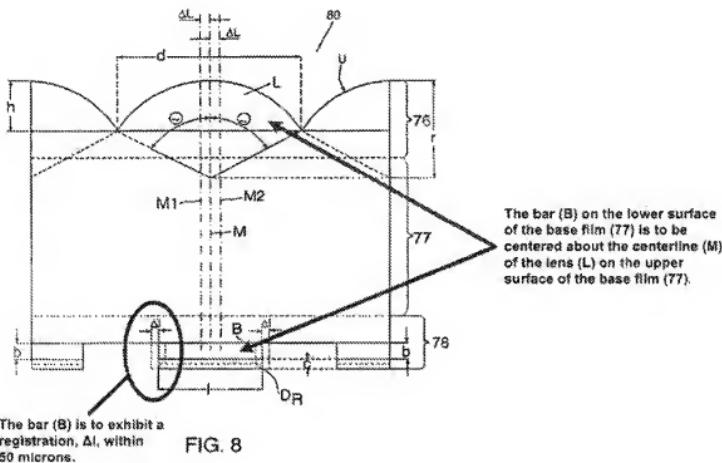


FIG. 8

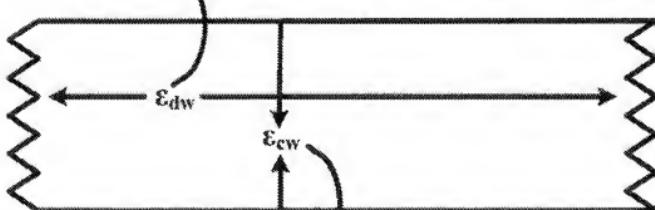
Although *Prix* contains a written description of an article having cross-web registration between structures on opposite sides of a base film to within 50 microns, *Prix fails to disclose an enabling description of an apparatus for producing such a film*. As described at MPEP §2121.01, although a prior art reference may recite each of the elements of a claim, the reference does not anticipate a claim if it fails to enable one of ordinary skill in the art to make the claimed invention. ("The disclosure in an assertedly anticipating reference must provide an enabling disclosure of the desired subject matter; mere naming or description of the subject matter is insufficient, if it cannot be produced with undue experimentation.") In short, it is insufficient for *Prix* to merely state that the registration obtained from the apparatus described therein creates a film exhibiting cross-web registration to within 50 microns. For the rejection to be proper, *Prix*

must actually enable one of ordinary skill in the art to make an apparatus that can produce film exhibiting registration within 50 microns.

As of the date of filing of this application, Applicants had been continuously pursuing the creation of a system for achieving such levels of registration for at least four years. Carlson Decl., ¶5. During that time, they have discovered certain factors that must be addressed to obtain levels of registration equal to or better than 50 microns. Carlson Decl., ¶6. *Prix* fails to mention or even appreciate these factors, meaning that it fails to enable one of ordinary skill in the art to make the claimed invention without engaging the same intensive development effort undertaken by the Applicants.

As an example of one factor not mentioned in *Prix*, Applicants point out the need to precisely control the speed of the various driven rollers. If the rollers do not operate at exactly the correct speed, the web will experience tension in the down-web direction, and will therefore exhibit strain in the down-web direction. Carlson Decl., ¶7. Consequently, the web will exhibit a strain in the cross-web direction, according to Poisson's ratio. Id.

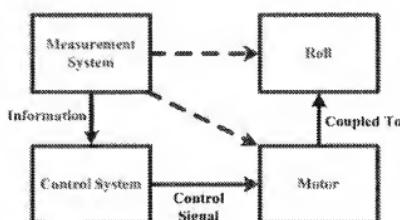
If the rollers do not operate at the same speed, the web experiences tension and exhibits strain,  $\epsilon_{dw}$ , in the down-web direction, meaning that the length of the web expands.



As a consequence of the down-web strain, the web also exhibits a cross-web strain,  $\epsilon_{cw}$ , which causes the width of the web to contract.

Cross-web contraction of the web causes the structures cast thereupon to be distorted in the cross-web direction, thereby harming the registration that can be achieved. Carlson Decl., ¶8. This effect goes unobserved in the context of cast structures requiring only ordinary levels of registration. Carlson Decl., ¶9. However, this effect cannot be ignored when attempting to achieve registration to within 50 microns for structures on opposite sides of the web. To achieve registration within 50 microns, then, a system must achieve precise control over the rotational speed of its driven rollers.

As shown below, to ensure precise control over the rotational position of a roll, a casting apparatus must include a measurement system for obtaining information concerning the rotational position of each roll. (Previously, the need to control the rotational speed of each roll was discussed, whereas the present passage refers to controlling the rotational position of each roll. Speed is the first derivative of position; by controlling the rotational position of each roll, the rotational speed of each roll is also controlled.) In turn, this information must be delivered to a control system that uses the information to generate a control signal that alters the rotational position of the motor's drive shaft. Finally, the drive shaft must be coupled to the roll in such a way that rotation of the motor's drive shaft results in precise and predictable rotation of the roll, i.e., the coupling must exhibit substantially no mechanical "play." Thus, as Applicants have pointed out in the presently pending application, three critical aspects must be taught to enable precise control over the speed of a roller: (1) a measurement system configured to obtain precise information regarding the angular position of the roll; (2) a control system that calculates a control signal on the basis of the information delivered from the measurement system; and (3) a coupling that ensures that rotation of the motor results in nearly identical rotation of the roll.



Notably, *Prix* either states no information about any of these three critical components, or where it does, *Prix* gets it wrong. For example, with regard to the measurement system for obtaining information concerning the angular position of each roll, *Prix* simply states that each motor is to have its own tachometer. See *Prix*, col. 5, line 47. Applicants, on the other hand, have found that the approach taught by *Prix* is doubly flawed. First, Applicants have found that tachometers provide imprecise information concerning the angular position of a roll, because tachometers only provide information concerning the angular velocity—not angular position. Carlson Decl., ¶11. Thus, integration must be performed to obtain the position, meaning that the error in the velocity measurement is also integrated, and therefore accumulates. Id. Moreover, *Prix* teaches using the tachometers to measure the velocity of a given motor's drive shaft. *Prix*, col. 5, line 47. Measurements obtained solely at the drive shaft do not provide precise information concerning motion of the roll, because coupling between the drive shaft and the roll is always, to some extent, mechanically imperfect. Carlson Decl., ¶11. By way of contrast, Applicants' specification teaches the use of encoders—not tachometers—located at both the drive shaft and the roll. Encoders directly measure angular position, as opposed to velocity, meaning that the angular position of both the drive shaft and the roll is used as an input to the control system, thereby providing the control system with better information with which to work. Carlson Decl., ¶12.

Applicants go on to respectfully note that, other than to recite the existence of a control system, *Prix* fails to state any teaching whatsoever regarding its structure or operation. Again, by way of contrast, Applicants' specification recites a specific example of a control system. See Application, Figure 10.

Turning to the coupling used to join a roll to a drive shaft, *Prix* teaches the use of a gear transmission to effect such coupling. See *Prix* at col. 3, lines 47-49. As stated in the Declaration of Mr. Carlson (enclosed herewith as Exhibit A), during the development of the system that is the subject of this application, Applicants conducted a thorough search for the very best precision gear transmissions available. Carlson Decl., ¶13. None of the gear transmissions exhibited the rotational accuracy needed to achieve registration to within 50 microns. Id. Thus, Applicants examined the possibility of directly coupling the motor to the roll. Carlson Decl., ¶14. Applicants discovered that the use of a substantially oversized bellows coupling to directly

couple the motor to the roll provided the desired stiffness and rotational accuracy. See Application, p. 11, lines 22-27. Applicants respectfully note that *Prix* teaches the use of a gear transmission to provide the coupling between a driven roll and a motor. See *Prix*, col. 5, line 45. Applicants contend that one of ordinary skill in the art could not achieve registration to within 50 microns using a gear transmission to provide coupling between a motor and a roll. Carlson Decl., ¶18.

In summary, *Prix* does not anticipate claims 1-11, because it does not enable registration of structures on opposite sides of a web to within 50 microns, as required by the claims. This conclusion is supported by the fact that *Prix* fails to describe any of the control mechanisms necessary to achieve precise control of the angular velocity of its rollers. Specifically, *Prix* fails to disclose:

- any mechanism for obtaining precise information concerning the angular position of its rolls
- any control loop at all
- a mechanism to couple a motor to a roll with the needed rotational accuracy.

Applicants respectfully point out that the discovery and address of these very issues has consumed the efforts of a design team that had worked continuously over the span of at least four years, as of the date of filing of this application. Carlson Decl., ¶16. *Prix* fails to mention these issues or any mechanisms for grappling with them. If, at the outset of their design effort, Applicants were provided the disclosure of *Prix*, Applicants would have been no closer to development of the claimed system. Applicants would have had to discover for themselves the fact that imprecise control over the speed of the rolls results in longitudinal strain, which, in turn, creates cross-web strain. Then, Applicants would have had to conclude that the cross-web strain was impeding their efforts to achieve cross-web registration. Finally, Applicants would have had to determine the proper measurement system, control loop, and couplings to solve the problem of obtaining precise control over the rotational position and speed of the rolls. In other words, one of ordinary skill in the art cannot take the disclosure of *Prix* and combined it with their

knowledge to arrive at the claimed invention. Instead, one would have to embark upon the same intensive development effort that was undertaken by Applicants.

Applicants respectfully point out that a reference contains an enabling disclosure only if "one of ordinary skill in the art could have combined the publication's description of the invention with his [or her] own knowledge to make the claimed invention." MPEP §2121.01. There presently exists no evidence that one of ordinary skill in the art would have within his knowledge the fact that imprecise control over the speed of a roll impacts cross-web registration. Moreover, the record reflects no evidence that one of ordinary skill in the art would have within his knowledge the proper measurement system, control loop, and couplings to solve the problem of obtaining precise control over the rotational speed of the rolls. Applicants respectfully observe that the Examiner is obligated to determine the patentability of a claim based upon the preponderance of the evidence. See MPEP §706: "The standard to be applied in all cases is the 'preponderance of the evidence' test. In other words, an Examiner should reject a claim if, in view of the prior art and evidence of record, it is more likely than not that the claim is unpatentable." The record contains no evidence tending to support the proposition that *Prix* contains an enabling description of the claimed subject matter. Accordingly, it is improper to reject it is improper to reject claims 1-11 as being anticipated by *Prix*. Applicants respectfully request reconsideration and withdrawal of the rejection of claims 1-11.

**II. SUMMARY**

Claims 1-22 remain pending in this application (claims 12-22 are withdrawn from consideration). Each of these claims is believed to be allowable for the reasons stated herein. This response is believed to be responsive to all points raised in the Office Action. Applicants urge prompt allowance and passage of this application to issuance. If the Examiner believes that discussion of any matter regarding this application is desirable, the Examiner is invited to call the undersigned attorney at the telephone number listed below.

Respectfully submitted,

Date: September 21, 2006

  
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